TRAKHTENBERG, N.M., insh.

Simplified measurement of the moisture content of [illegible] felts. Tekst.prom. 20 no.2:57-59 F '60.

(Felt—Testing)

ROSTOVTSEV, V.Ye., kand.tekhn.nauk; TRAKHTENBERG, R.M., inzh.

Dyeing fabrics under the effect of electric currents. Tekst.prom. 19 no.4:55-58 Ap '59. (MIRA 12:6)
(Dyes and dyeing--Apparatus) (Electrochemistry)

AUTHOR

S/103/62/023/009/007/007
D201/D308

AUTHOR: Trakhtenberg, R. M. (Ivanovo)

TITLE: A method of coding of frequency ratios in automatic devices

PERIODICAL: Avtomatika i telemekhanika, v. 23, no. 9, 1962, 1254-1259

TEXT: The author describes a method of coding by using a special binary code. It is based on the use of digital circuit elements for representing the Lissajous figures in the form of a binary code. Frequencies produced by trains of pulses of short duration are compared, superposed and it is determined whether a certain number of pulses of one of the frequencies occurs within the period of the other frequency. In this manner a sequence of pulse combinations is obtained, each combination representing a coded ratio of frequencies, i.e. a certain Lissajous figure. Coding and decoding formulas are derived. The accuracy of the method is discussed on the basis of analysis of possible resulting code combi-

Card 1/2

A method of coding ...

nations, and coding circuits are suggested. It is stated that: 1) The method is simple and can be easily applied to automatic processing. 2) Only simple digital circuit elements are required. 3) The proposed method of frequency superimposition may be successfully used for checking and/or automatic control of any physical quantity converted into an oscillation frequency. There are 5 figures.

SUBMITTED: March 20, 1962

TRAKHTENBERG, R. M. (Ivanovo)

Method for coding frequency ratios in automatic devices. Avtom. i telem. 23 no.9:1254-1259 S '62. (MIRA 15:10)

(Information theory)
(Automatic control)
(Telemetering)

TRAKHTENBERG, R.M.

Stabilizing the speed of an electric motor. Avtom.i prib. no.4:21-25 O-D '62. (MIRA 16:1)

1. Ivanovskiy energeticheskiy institut.
(Electric motors) (Electronic control)

L 38233-66 EWT(d)/EWP(k)/EWP(h)/EWI(1)/EWP(v) BC
ACC NR: AP6010287 (A,N) SOURCE CODE: UR/0103/66/000/003/0125/0135

AUTHOR: Trakhtenberg, R. M. (Ivanovo)

ORG: none

TITLE: Discrete integral action controller for electric drive speed

SOURCE: Avtomatika i telemekhanika, no. 3, 1966, 125-135

TOPIC TAGS: speed regulator, digital system, electric motor

ABSTRACT: A discrete integral action controller has been designed from digital components. The principle of the controller is based on a comparison of the measured and reference values by means of a static trigger, and on a discrete variation of the scale of the measured value. In this design, the counter functions as a frequency divider; the coding device, consisting of two triggers and delay line, is replaced by one trigger. Analytical and experimental studies of the excitation coil, the transfer function, the integral action of the controller and of the slave element were performed. It was found that an effective stabilization method of a control system with a dc source is a positive elastic current feedback. This is easily accomplished by the introduction of a differentiating transformer and a transistor operating on the natural pulses of the anchor current. In analyzing the dynamics and particularly the stability of the system, it is important to consider the decrease in the inductivity of the

Card 1/2 UDC: 62-531.6

L 38233-66
ACC NR: AP6010287

chain with ferromagnetic material on account of the hysteresis. Orig. art. has: 6 figures, 22 formulas.

SUB CODE: 09,13/ SUBM DATE: 12Oct65/ ORIG REF: 006

Card 2/2

TRAKHTENBERG, S.I.; SHUTER, L.A.; STEPANCHENKO, N.A. [Stepanchenko, M.A.] SHTERN, A.A.; ZHURAVSKIY, V.A. [Zhuravs'kyi, V.A.]; KAPLAN, K.L.

Preparation of the modified MBK-258 casein and its use in the treatment of chrome leather. Leh. prom. no.1:46-48 Ja-Mr '65. (MIRA 18:4)

TRAKHTENBERG, S.I.; KOROSTYLEVA, R.N.

Determination of the composition of products of graft copolymerization of esters of acrylic acid with casein. Vokl. LS 5 no. 1/2:20-24 '63. (MIRA 17:6)

SHUTER, L.M.; TRAKHTENBERG, S.I.

Synthesis of casein-acrylate film-forming materials for the surface dyeing of leather. Dokl. LPI 5 no. 1/7:25-28 '63. (MIRA 17:6)

BERKMAN, Ya.P.; SHUTER, L.M.; TRAKHTENBERG, S.I.

New protein acrylate film-forming agents for dye coating of leather. Kozh.obuv.prom. 4 no.1:20-23 Ja '62. (MIRA 15:3)
(Films (Chemistry)) (Dyes and dyeing--Leather)

LEVIN, Ye.M. prof., TRAKHTENBERG, Sh.Ye., dots.

Suppurative skin diseases in sugar factory workers. Sov.med. 22 no.4:144-147 Ap '58 (MIRA 11:7)

1. Iz kafedry kozhno-venericheskikh bolezney (zav. - prof. Ye.M. Levin) Vinnitskogo meditsinskogo instituta.

(OCCUPATIONAL DISEASES,
pyoderma in sugar factory workers (Rus))
(PYODERMA, epidemiology,
in sugar factory workers (Rus))

L 05274-67 EWT(d)/EWP(v)/EWP(k)/EWP(h)/EWP(l) SOURCE CODE: UR/0372/66/000/003/G042/G04[illegible]

ACC NR: AR6023999

AUTHOR: Trakhtenberg, V. S.

TITLE: Certain problems relating to the solution of the extremal problems of optimal design by search methods

SOURCE: Ref. zh. Kibernetika, Abs. 3G317

REF SOURCE: Sb. Avtomatika i vychisl. tekhn. No. 10. Riga, Zinatne, 1965, 27-32

TOPIC TAGS: optimal control, logic design, mathematic space

ABSTRACT: The possible paths for the solution of problems of optimal design by means of search methods are considered. The process of the designing of complex systems is characterized by problems of selecting parameters at which the system satisfies a number of quality criterions. The search domain is usually a n-variate zone whose boundaries with respect to the parameters are specified numerically or in the form of certain functions. The problem reduces to optimizing some generalized quality criterion following the construction of the functional expressing the parametric dependence of quality criteria. It is pointed out that in reality it is often impossible to quantitatively estimate the individual real criterions and to

UDC: 62-506:681.142:621.3.001.1:51

Card 1/2

...sence of such non...
semiautomatic process
... U. [Translation of ab-

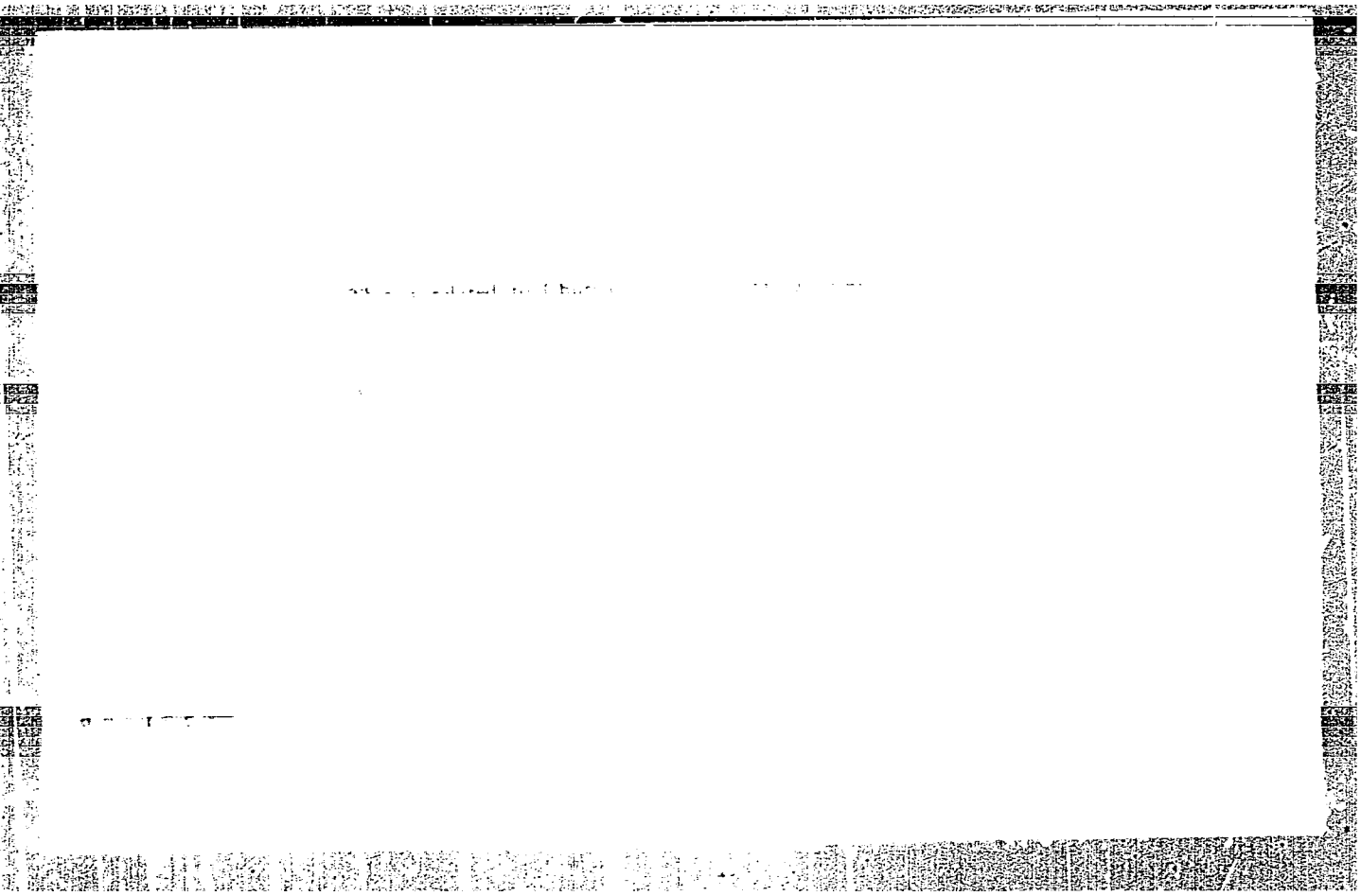
2/2 eqh.

ROTKOP, ?.?.; [illegible]FETSHTEYN, Ye.M.; MANDEL'SHTEYN, M.L.

Static characteristics of the rectifying tower. Ferm. i spirt. prom. 31 no.6:13-18 '65.

TRAKHTENBERG, Z.Z.; CHUBENKO, A.K.

Eliminating defects in castings and parts with pastes on epoxy, polyester, and acrylic resin base. Lit.proizv. no.10:37 O '64.
(MIRA 18:4)



APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R001756420020-4"

1. TRAKHTENBROT, B. A.

2. USSR (600)

4. Series

7. Recurring separation. Dokl. AN SSSR 88, No. 6, 1953.

Demonstrates the theorem that the set of all identically true formulas of a narrow functional calculus is inseparable recursively from the set of all formulas ultimately negated. A set N os called recursive if simultaneously N and its complement are recursively countable with the set of all natural numbers. Presented by Acad A.N.Kolmogorov 22 Dec 52.

258T103

9. Monthly List of Russian Accessions, Library of Congress, May 1953. Unclassified.

TRAKHTENBROT, B.A., kandidat fiziko-matematicheskikh nauk.

Analog representation of functions in finite classes. Uch.zap. Penz.gos.ped.inst. no.2:61-78 '55. (MLRA 10:2)

(Functions)

TRAKHTENBROT, B A.

USSR/Mathematics

Card 1/1 Pub. 22 - 6/49

Authors : Trakhtenbrot, B. A.

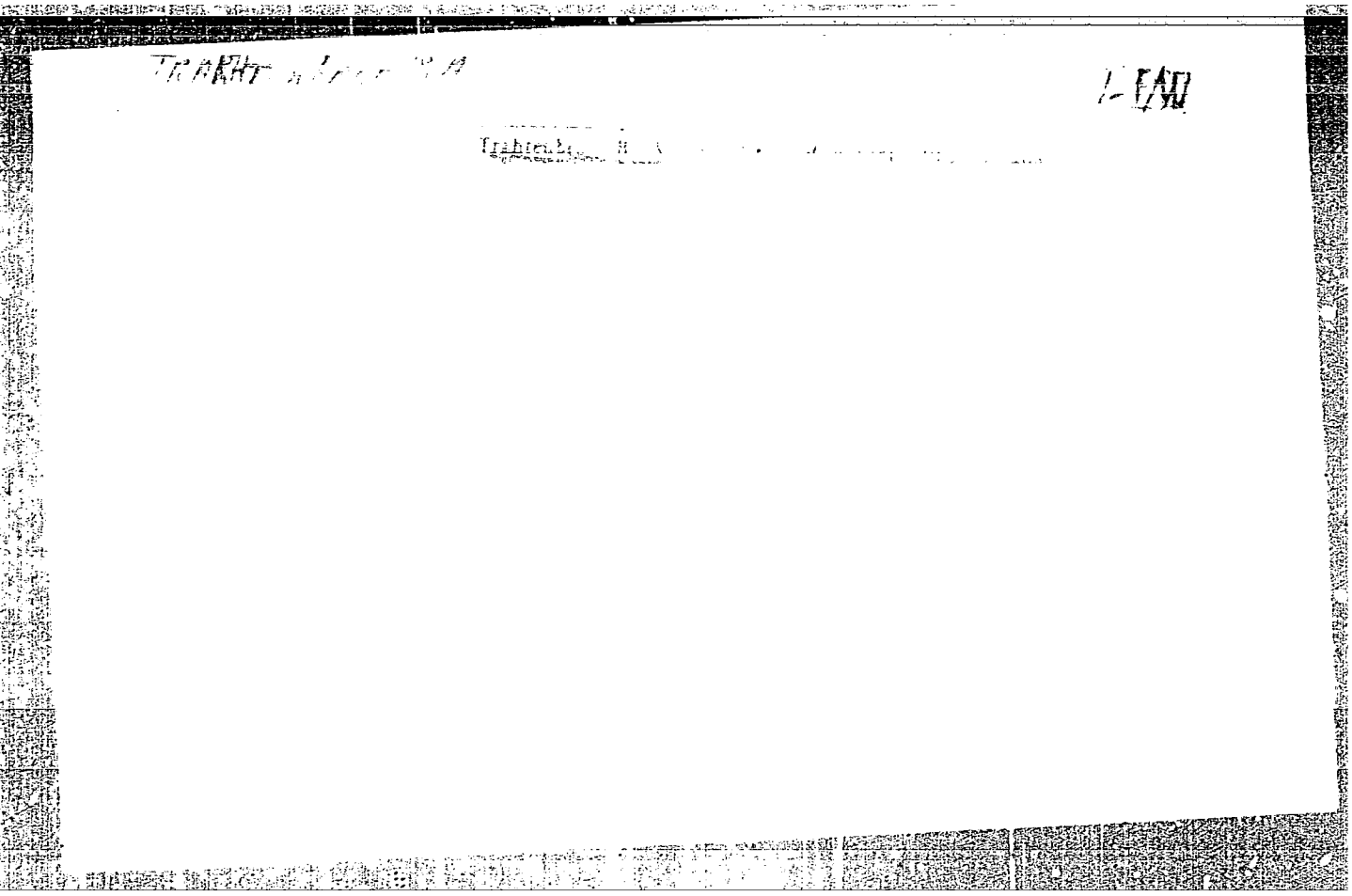
Title : Tabular presentation of recurring operators

Periodical : Dok. AN SSSR 101/3, 417-420, Mar 21, 1955

Abstract : A concept of the so-called signalizing function is outlined. This concept helps in clarifying some specific features of the primitive recurring calculation process and this in return, helps to establish a relationship between the recurring operations and the table conversion process described by Post (the Post tabular presentation of recurring operators). Two references: 1 USA and 1 USSR (1944).

Institution : .....

Presented by : Academician A. N. Kolmogorov, December 25, 1954



TRAKHTENBROT, B.A.

SUBJECT USSR/MATHEMATICS/Functional analysis CARD 1/2 PG - 305

AUTHOR KUZNECOV A.V., TRACHTENBROT B.A.

TITLE Investigation of the partial recursive operators with the means of the theory of the Baire space.

PERIODICAL Doklady Akad. Nauk 105, 897-900 (1955)

reviewed 10/1956

The operators considered are partial recursive operators $g = T[f]$ where f is a function of one variable and g is a function of one variable or a constant. O_T denotes the domain of full definition of the operator T, i.e. the set of all those fully defined functions f for which $T[f]$ is also fully defined. The author gives examples to show how diverse the sets O_T can be. He then correlates each fully defined function f with the point $<f(0),f(1),\ldots>$ of the Baire space J. A primitive recursive enumeration δ^n of the Baire intervals is given and a set is called effectively open if it is representable in the form $\bigcup_{n=1}^{\infty} \delta^{a(n)}$ where a(n) is general recursive. Effective G_δ, F_σ, $G_{\delta\sigma}$ etc are defined similarly. Theorem 1. Every partial recursive operator $g = T[f]$, considered over J only, has a representation in the form

$g(x) = b(\mu t(f \mathcal{E} \delta^{a(x,t)}))$ where a and b are primitive recursive. Theorem 2. A necessary and sufficient condition that there exists a partial recursive operator T such that $O_T = M$ is that M be an effective G_δ. Effective continuity, uniform continuity, compactness and boundedness are then introduced and their relations investigated, e.g. Theorem 3. Every partial recursive operator gives an effectively continuous mapping of its full definition into J. Theorem 4. A mapping which is effectively continuous on an effectively compact set is effectively uniformly continuous on it. Theorem 5. If T is a partial recursive operator then on any effectively closed $M \subseteq O_T$ it is general recursive. Finally various results are proved which bear on the problem of which functions are reducible to effectively closed points.

TRAKHTENBROT, B. A. and KOBRINSKIY, N. Ye.

THE DEVELOPMENT OF A GENERAL THEORY OF "LOGICAL NETS,"
O Postroyenii Obshchey Teorii Logicheskikh Setey, 1956.

TRAKHTENBROT, B.A.

Call Nr: AF 1108825

Transactions of the Third All-union Mathematical Congress (Cont.) Moscow, Jun-Jul '56, Trudy '56, V. 1, Sect. Rpts., Izdatel'stvo AN SSSR, Moscow, 1956, 237 pp.

Muchnik, A. A. (Moscow). Solution of Post's Reduction Problem. 184

Sodnomov, B. S. (Ulan-Ude). Consistency of Projectivity of Some Uncommon Sets. 184-185

Trakhtenbrot, B. A. (Penza). Descriptive Classifications in Recursive Arithmetics. 185

Uspenskiy, V. A. (Moscow). Calculable Operations, Calculable Operators, and Constructively Continuous Functions. 185

There are 2 references, 1 of which is USSR, and another English.

Uspenskiy, V. A. (Moscow). Concept of Program and Computed Operators. 186

Mention is made of Kolmogorov, A. N.

Card 59/80

TRAKHTENBROT, B.A. (Penza)

Algorithms and the mechanical solution of problems. Mat.v shkole no.4:3-10 Jl-Ag '56. (MLRA 9:9)
(Algorism) (Calculating machines)

TRAKHTENBROT, B.A.

Algorithms and the mechanical solution of problems. Mat. v shkole no.5:5-14 S-O '56. (MLRA 9:10)
(Calculating machines) (Algorism)

TRAKHTENBROT, B.A.

SUBJECT USSR/MATHEMATICS/Foundations of mathematics CARD 1/3 PG - 996
AUTHOR TRACHTENBROT B.A.
TITLE The definition of the finite set and the deductive incompleteness of the set theory.
PERIODICAL Izvestija Akad.Nauk 20, 569-582 (1956)
reviewed 7/1957

The main results of this paper stem from an elegant lemma to the effect that there exist recursively enumerable sets E_1, E_2 which are strongly inseparable, i.e. such that 1) $E_1 \cap E_2 = 0$, 2) if M is any recursively enumerable set then if $M \setminus E_1$ is infinite $M \cap E_2 \neq 0$ and if $M \setminus E_2$ is infinite then $M \cap E_1 \neq 0$, 3) $N \setminus (E_1 \cup E_2)$ is infinite, where N is the set of all natural numbers. Since it is easily shown that strongly inseparable sets are recursively inseparable but not effectively inseparable, and are non-universal this answers affirmatively a question of Novikoff "Do there exist non-universal recursively inseparable sets?" and a question of Uspensky "Do there exist recursively inseparable sets which are not effectively inseparable?". The author goes on to consider many other questions concerned with recursively inseparability. He proves for example, that every simple set H which is not hypersimple is representable in

the form $H_1 \cup H_2$ where H_1, H_2 are disjoint recursively inseparable recursively enumerable sets, and asks whether this is also true for hypersimple H. He defines a set of pairs as a set E_1 such that there exists a recursively enumerable set E_2 with $E_1 \cap E_2 = 0$ and E_1, E_2 strongly inseparable. He defines a recursively enumerable set H to be simple with respect to a containing set E if $E \setminus H$ is an infinite set containing no infinite recursively enumerable subset. He proves inter alia that if E_1, E_2 are recursively inseparable recursively enumerable sets and H is simple with respect to E_1 then H is recursively inseparable from E_2 and that a set of pairs is not simple with respect to any recursively enumerable set. He asks whether there exists a recursively enumerable set neither simple nor a set of pairs with respect to any recursively enumerable set; also whether a universal set can be simple with respect to a non-universal set (or vice-versa). He considers the behavior of recursive separability under computable homomorphism. Finally he generalizes the notion of separability to that of K-separability, viz: Let K be any ring of sets in a space M. Call E_1, E_2 of M K-separable if there exist sets G_1, G_2 of K such that $E_1 \subset G_1$, $E_2 \subset G_2$, $G_1 \cup G_2 = M$, $G_1 \cap G_2 = E_1 \cap E_2$. If K is the

ring of recursively enumerable sets he calls E_1, E_2 recursively enumerable. He shows that, although a simple set is recursively separable from any recursively enumerable set disjoint from it, nevertheless there exist two simple recursively enumerable inseparable recursively enumerable sets. Finally he asks whether fro each recursively enumerable set which is not recursive there a recursively enumerable set which is recursively enumerable inseparable from it.

TRAKHTENBROT, Boris Avraamovich; GORYACHAYA, M.M., red.; YERMAKOVA, Ye.A., tekhn.red.

[Algorithms and mechanical solution of problems] Algoritmy i mashinnoe reshenie zadach. Moskva, Gos. izd-vo tekhniko-teoret. lit-ry, 1957. 94 p. (Populiarnye lektsii po matematike, no.26) (Calculating machines) (MIRA 11:4) (Algorism)

TRAKHTENBROT, B. A. and KOBRINSKIY, N. E.

"Construction of a General Theory of Logical Systems," a paper given at the Conference of European Statisticians Meeting on Data-Processing Electronic Machines, Geneva, 21-24 January 1957

4036051

TRAKHTENBROT, B.A.

SUBJECT USSR/MATHEMATICS/Foundations of mathematics CARD 1/1 PG - 878
AUTHOR TRAKHTENBROT B.A.
TITLE On operators being realizable in logical nets.
PERIODICAL Doklady Akad.Nauk 112, 1005-1007 (1957)
reviewed 6/1957

The present paper concerns some generalisations of the results of Burks and Wright (Proc.Inst.Rad.Eng. 41, 10 (1953)) and Sestakov (Avtomat.i. Telemech. 15, 2 and 4 (1954); Doklady Akad.Nauk 99, 6 (1954)). A well-known result of Moore is given.

INSTITUTION: Educational Institute, Penza.

16(1) p. 6

PHASE I BOOK EXPLOITATION SOV/1708

Akademiya nauk SSSR. Matematicheskiy institut

Sbornik statey po matematicheskoy logike i yeye prilozheniyam k nekotorym voprosam kibernetiki (Collection of Articles on Mathematical Logic and Its Applications to Certain Problems of Cybernetics) Moscow, Izd-vo AN SSSR, 1958. 362 p. (Series: Its: Trudy, t. 51) 3,500 copies printed.

Resp. Ed.: S.V. Yablonskiy, Candidate of Physical and Mathematical Sciences; Ed. of Publishing House: A.Z. Ryvkin and L.K. Nikolayeva; Tech. Ed.: T.P. Polenova.

PURPOSE: This collection of articles contains original contributions of Soviet mathematicians in mathematical logic and is intended for mathematicians working in this field.

COVERAGE: The articles deal with studies of problems connected with mathematical logic and their applications to certain problems of cybernetics. Primarily, switching circuits are studied, but many

Card 1/7

of the results obtained are of a more general character. The content of the collection of articles is closely connected with many branches of cybernetics which study the methods of describing the processing of discrete information, problems of the analysis and synthesis of control systems, and methods of controlling the performance of control systems. The characteristic feature of these articles is their connection with various fields of mathematics such as mathematical logic, combination analysis, set theory, algebra, topology and theory of numbers. All articles were written in the years 1954-1955, and the concepts presented are arranged in the book in a systematic order. The first articles concern problems of mathematical logic, then problems of the theory of the synthesis of circuits are examined, and finally problems of the theory of controlling the performance of circuits are considered. The editor thanks Professor A.A. Lyapunov, Professor S.A. Yanovskiy, B.Yu. Pil'chak, A.P. Yershov, V.A. Uspenskiy, and Yu.I. Yanov for their remarks in connection with the final editing of the collection.

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LK/ad
6-16-59

ГАЛИЦКИЙ, Е.Л.

AUTHOR: Nagibin, F.F., (Kirov)

TITLE: Intervuz Scientific and Methodical Conference of Chairs of Mathematics (Konferentsiya matematicheskikh kafedr)

SOV/3-58-12-28/43

PERIODICAL: Vestnik vysshey shkoly, 1958, Nr 12, pp 75 - 76 (USSR)

ABSTRACT: The yearly scientific-methodical conferences of the chairs of mathematics of the pedagogical institutes of the Ural have become a tradition. The 16th Conference which took place at the Kirovskiy pedagogicheskiy institut (Kirov Pedagogical Institute) was attended by 162 instructors of 50 vuzes from all over the country. Professor A.I. Markushevich, RSFSR Deputy Minister of Education, participated at the conference. At the plenary meetings, the following reports were discussed: Professor V.I. Levin (Moscow) on the development of instruction in mathematics at secondary schools; Professor A.I. Markushevich - on the concept of values; Docent B.A. Trakhtenbrot (Penza) - on the experience gained in teaching the elements of mathematical logic in a pedagogical vuz; Professor L.I. Volkovyskiy (Perm') - on the organization of work in a special seminar on mathematics; Docent N.N. Kharin (Kirov) - on contradictions in mathematics. Five sections were functioning during the conference. The reports of the following lecturers were heard: Ye.S. Berezanskaya, V.S. and L.S.

Card 1/2

Intervuz Scientific and Methodical Conference of Chairs of Mathematics

Karnatsevich, P.A. Budantsev, and M.C. Kilina. The proceedings of the conference will be published. The next conference will take place in the Orenburgskiy pedagogicheskiy institut (Orenburg Pedagogical Institute) during the winter vacation of 1958/59.

TRAKHTENBROT, B.A.

Theory of nonrepetitive contact circuits. Trudy Mat.inst. 51: 226-269 '58. (MIRA 11:11)
(Electric circuits)

ACCESSION NR: AP4012350 S/0199/64/005/001/0186/0191

AUTHOR: Trakhtenbrot, B. A.

TITLE: An estimation of the weight of a finite tree

SOURCE: Sibirskiy matematicheskiy zhurnal, v. 5, no. 1, 1964, 186-191

TOPIC TAGS: tree, finite tree, memory, memory size, computer language, transliteration, machine translation

ABSTRACT: Using elementary combinatorial arguments, the author establishes an apriori estimate for the size of the memory of a finite automaton which is required to transform a word written in an input alphabet of m letters into an output alphabet of n letters. The argument is centered around a previously proven result by the same author (Doklady Ak. Nauk SSSR, 112, No. 6 (1957), pp. 1005-1007). Using the following notations: (1) Let $V_{mn}(\mu)$ be the set of all finite trees of height μ for a fixed input alphabet of m letters and an output alphabet of n letters, (2) $D_{mn}(\mu)$ be the number of trees in $V_{mn}(\mu)$, and (3) C_{mn} be a constant depending on m and n. The author establishes: Theorem 1: If k(V) denotes the magnitude of the weight of tree v, then as $\mu \longrightarrow \infty$, for every $v \in V_{mn}(\mu)$,

$$k(v) < \frac{Cm^{\mu+1}n}{\mu}[1 + o(1)]; \quad (1)$$

Card 1/3

moreover, for each $\epsilon > 0$, for those trees satisfying

$$k(v) < (1-\varepsilon)\frac{Cm^{\mu+1}}{\mu}. \quad (2)$$

we find that k tends to zero for $\mu \to \infty$. Theorem 2: For any choice of m and n, there e exists an increasing sequence $\{\mu_l\}$ such that for all trees $v \in v_{mn}(\mu_l)$

$$k(v) < \frac{Cm^{\mu_l+1}}{\mu_l}[1+o(1)]. \quad (3)$$

Moreover, for arbitrarily large μ, there exist m and n such that for one or more trees $v \in v_{mn}(\mu)$, we have

$$k(v) > \frac{Cm^{\mu+1}}{\mu}. \quad (4)$$

The author then discusses the choice of the parameters m and n and their effect upon the size of memory needed. It is shown that an optimal choice must be such that $\log_m n$ is rational. Finally, the construction of optimal trees is discussed. Orig. art. has: 3 figures and 10 formulas.

ACCESSION NR: AP4012350

ASSOCIATION: none

SUBMITTED: 22Nov62 DATE ACQ: 26Feb64 ENCL: 00

SUB CODE: DP, MA NO REF SOV: 003 OTHER: 000

Card 3/3

AUTHOR: Trakhtenbrot, B.A.

TITLE: Synthesis of Logical Nets, the Operators of Which are Described by Means of the Monadic Predicate Calculus (Sintez logicheskikh setey, operatory kotorykh opisany sredstvami ischisleniya odnomestnykh predikatov)

20-118-4-6/61

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol 118, Nr 4, pp 646-649 (USSR)

ABSTRACT: A Λ-operator is an operator

$$Z(t) = T\left[X_1,\ldots,X_n,t\right]$$

which changes the system $\{X_i(\tau)\}$ (time $\tau=1,2,\ldots$) of initial predicates into the final predicate $Z(t)$ being defined with the aid of the canonical system

$$Z(t) = \phi\left[X_1(t),\ldots,X_n(t),\ \Gamma_1(t),\ldots\ \Gamma_k(t)\right]$$

$$\Gamma_\nu(t+1) = \psi_\nu\left[X_1(t),\ldots,\ \Gamma_1(t),\ldots,\ \Gamma_k(t)\right]$$

$$\Gamma_\nu(1) = \sigma_\nu \text{ (initial state)},$$

Card 1/2 where ϕ and ψ_ν are functions of the propositional calculus

Synthesis of Logical Nets, the Operators of Which are Described by Means of the Monadic Predicate Calculus 20-118-4-6/61

and δ_ν are the constants 0 or 1, $\nu = 1,\ldots,k$. The formulas are the usual formulas of the extended monadic predicate calculus, where the predicate quantors are bounded. A formula is a t-formula if in it there appears exactly one variable and all predicate quantors are t-controllable. The notion "t-controllable" is introduced inductively.
Theorem: Every Λ-operator is described by a t-formula.
Theorem: Every t-formula with the free variables $X_1, X_2, \ldots, X_n$ describes a Λ-operator which acts on the predicate system $\{X_i\}$.
There are 4 Soviet references.

ASSOCIATION: Penzenskiy gosudarstvennyy pedagogicheskiy institut im.V.G. Belinskogo (Penza State Pedagogical Institute im.V.G.Belinsky)
PRESENTED: July 18, 1957, by M.V.Keldysh, Academician
SUBMITTED: July 16, 1957
AVAILABLE: Library of Congress

Card 2/2

TRAKHTENBROT, B.A.

28(2) PHASE I BOOK EXPLOITATION SOV/2675

Moscow. Dom nauchno-tekhnicheskoy propagandy im. F. E. Dzerzhinskogo

Vychislitel'nayа tekhnika i yeye primeneniye (Computation Technique and Its Application) Moscow, Gosenergoizdat, 1959. 391 p. (Series: Obshchestvo po rasprostraneniyu politicheskikh i nauchnykh znaniy RSFSR) 5,000 copies printed.

Ed. (title page): S. A. Lebedev, Academician; Ed. (inside book): V.I. Savel'yev; Tech. Ed.: G. I. Maleyev.

PURPOSE: This collection of articles is intended for scientific, engineering and technical personnel engaged in research, design and operation of digital and analog computers. It may also be used by students of vuses specializing in computers.

COVERAGE: The authors present fundamentals of digital computers, their elements and units such as arithmetic units, internal and external memory and control devices. They discuss the possibility of constructing computers using semiconductor elements and consider the fundamentals in the theory of logical circuits. They also discuss problems of programming and explain the operation of analog computers and their elements. Brief discussion of mathematical instruments is also presented. The articles were presented at a computer seminar arranged by Moskovskiy dom nauchno-tekhnicheskoy propagandy imeni F. E. Dzerzhinskiy (Moscow Center for Scientific and Technical Propaganda imeni F. E. Dzerzhinskiy) in 1957. No personalities are mentioned. References appear at the end of some articles.

Shchepkin, O. K. Power Supply for Electronic Computers 217
The author discusses power supply systems of electronic computers and describes methods of constructing protective and signalling circuits. There are 10 references: 7 Soviet and 3 English.

Rhotanova, Ye. A., Candidate of Technical Sciences. Some Problems in the Design of Special High-speed Computers 236
The author discusses the operation of parallel, series and series-parallel digital computers and their components. He considers requirements of computers and discusses methods of preparing programs. There are no references.

Kobrinskiy, B. Yu., Professor, Doctor of Technical Sciences, and Trakhtenbrot, B. A., Candidate of Physical and Mathematical Sciences. Fundamentals of the Theory of Logical Circuits 248
The authors consider problems of analysis and synthesis of logical circuits in computers. They describe methods of transforming and coding information and circuits used. There are no references.

Card 6/8

16(1)

AUTHOR: Trakhtenbrot, B.A. SOV/20-127-2-13/70

TITLE: Asymptotic Estimate of the Complexity of Logical Nets Endowed With Memory

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 2, pp 281-284 (USSR)

ABSTRACT: O.B.Lupanov has found a method for the synthesis of certain logical nets (so-called "schemes of functional elements") with the aid of which the asymptotic formula (compare [Ref 1])

(1) $L(n) \sim \varsigma \frac{2^n}{n}$

or

(1') $L(n) \sim \varsigma \frac{\lg Q(n)}{\lg \lg Q(n)}$,

where Q(n) is the number of all functions of the logical algebra, could be obtained. In the present paper the same problem is treated for logical nets with memory, where the base may contain elements of retardation and the formation of loops of regression

Card 1/2

Asymptotic Estimate of the Complexity of Logical Nets Endowed With Memory SOV/20-127-2-13/70

is admitted. An analogue of (1') is proved. 4 theorems and a series of definitions and remarks are formulated.
There are 5 references, 4 of which are Soviet, and 1 American.

ASSOCIATION: Penzenskiy politekhnicheskiy institut (Penza Polytechnical Institute)

PRESENTED: April 2, 1959, by M.V.Keldysh, Academician

SUBMITTED: March 31, 1959

Card 2/2

PHASE I BOOK EXPLOITATION SOV/5284

Trakhtenbrot, Boris Abraamovich

Algoritmy i mashinnoye resheniye zadach (Algorisms and the Mechanical Solution of Problems) 2d ed. [rev. and enl.] Moscow, Fizmatgiz, 1960. 117 p. 25,000 copies printed.

Ed. (Title page): S. V. Yablonskiy; Ed.: M. M. Goryachaya; Tech. Ed.: I. Sh. Aksel'rod.

PURPOSE: This book is intended for advanced students, instructors, engineers, technicians, and other readers interested in the new computing techniques.

COVERAGE: The book considers, in popular form, a number of problems on the boundary between mathematical logic and the theory of automatic computing machines. The theory of algorisms and its connection with modern computer mathematics is treated. The author discusses in detail the development of the concept of algorisms, the operating principle of modern high-speed

Card 1/4

calculating machines, the fundamentals of programming, the design configuration of Thüring's calculating machine, and problems which are not solvable by the method of algorisms. The book is based on popular lectures and surveys given by the author and on an article with the same title which he wrote for the journal Matematika v shkole, nos. 4 and 5, 1956. The book was supplemented with new material and considerably revised for the second edition. Sections 2, 12, and 13 are entirely new. Emil Post, P. S. Novikov, and G. S. Tseytin are mentioned in the text. There are 5 references: 4 Soviet and 1 English.

TABLE OF CONTENTS:

Preface 3

Introduction 5

1. Numerical Algorisms 7

TRAKHTENBROT, B.A.

Some constructions in the logic set of one-digit predicates. Dokl. AN SSSR 138 no.2:320-321 My '61. (MIRA 14:5)

1. Predstavleno akademikom P.S.Novikovym.
(Electronic calculating machines) (Calculus of predicates)

28665
S/020/61/140/002/010/023
B109/B125

16.6800

AUTHOR: Trakhtenbrot, B. A.

TITLE: Finite automatic devices and the logic of one-place predicates

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 2, 1961, 326-329

TEXT: Previous papers of the author (Ref. 1: DAN, 118, no. 4 (1958); Ref. 2: DAN, 138, no. 2 (1961)) and of J. R. Büchi (Zs. f. Math. Logik u. Grundl. d. Math., 6, 66 (1960)) dealt with the relationship between finite automatic devices and formal language, basing on the logic of one-place predicates under restrictive conditions. These restrictions are eliminated in the present paper, and the following problems regarding the I-language (Ref. 2) are dealt with: 1) Finding out which sets and operators can be described in the I-language; 2) criterions for the existence of finite operators satisfying a given formula from I; 3) study of the transition from one formula to the corresponding canonical equation. Notation: the same as that adopted in Refs. 1 and 2, with the only difference that t-formulas of Ref. 1 are referred to as lower t-formulas. Upper

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t-formulas differ from lower t-formulas in that the determination of the t-controllable quantor necessitates to write everywhere "on" as, e. g., in $(\underset{\tau \gg t}{E\tau})\ [X(\tau)\&(\underset{\tau \gg \rho \gg t}{E\tau})\ (\rho)\Gamma(\rho)]$. Furthermore, a recursive operator, reducing the system of the predicates $\{X_i(\tau)\}$ to the system $\{Z_j(\tau)\}$, is supposed to be called finite if it can be written in canonical equations (see Ref. 1, formula (2)). The set $\mathcal{M}$ is taken as homogeneous of the degree k if there are not more than k pairwise different sets in all various $\mathcal{M}\sigma_1 \ldots \sigma_\nu$.

The sets $\hat{X}\mathcal{A}(X)$, $\hat{X}\hat{Y}\mathcal{A}(X,Y)$, ... are referred to as I-definable. The following theorems are then valid: Theorem 1: There is an algorithm reducing an arbitrary formula $\mathcal{A}[X_1, X_2, \ldots X_m]$ from I to an equivalent formula of the particular form $\Phi[\Gamma_1, \ldots, \Gamma_a, \tilde{\Gamma}_1 \ldots \tilde{\Gamma}_b]$, where Φ denotes a function of the algebraic logic, Γ_j stands for the lower t-formula, $\tilde{\Gamma}_j$ is the upper t-formula. Theorem 2: All I-definable sets are homogeneous.

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Finite automatic devices and the logic ...

Theorem 3: Each closed homogeneous set is I-definable by a formula of the form [predicate-like quantors] (t) [quantorless part]. Theorem 4: If $\mathfrak{M}$ $\hat{X}\hat{Y}\mathcal{A}(X,Y)$ is a graph of a continuous, everywhere defined function $Y = T[X]$, T will be a finite operator. Theorem 4': $\hat{X}\hat{Y}\mathcal{A}(X,Y)$ is supposed to be closed. There will be a solution with a finite operator of the weight $< k$ if $\mathcal{A}(X,Y)$ has a continuous solution. An operator without anticipation occurring in the process entails the existence of a certain L-operator of the weight $< k$. The following theorem serves for solving the problem of finding all solutions of $\mathcal{A}$ represented by finite automatic devices: An L-operator $Y = T(X,U,V)$ will be a general L-solution of the formula $\mathcal{A}(X,Y)$ if: 1) all L-solutions $\mathcal{A}(X,Y)$ can be obtained from T by substituting U by L-operators $U=T_u(X), V=T_v(X)$; 2) an L-solution is obtained by any substitution of the variables U,V in T by the L-operators $T_u(X), T_v(X)$. Then, theorem 5 is valid: Two alternative possibilities arise if there is such a formula $\mathcal{A}$ that $\hat{X}\hat{Y}\mathcal{A}(X,Y)$ is closed: 1) In general, $\mathcal{A}$ has no solution without anticipating; 2) there is a general L-solution for

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Finite automatic devices and the logic ...

$\mathcal{A}$ with a weight not exceeding the degree of homogeneity. This solution is the general D-solution. There are 9 references: 4 Soviet and 5 non-Soviet.

ASSOCIATION: Institut matematiki s vychislitel'nym tsentrom Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Mathematics and Computer Center of the Siberian Department of the Academy of Sciences USSR)

PRESENTED: May 16, 1961, by P. S. Novikov, Academician

SUBMITTED: April 29, 1961

Card 4/4

KOBRINSKIY, Natan Yefimovich; TRAKHTENBROT, Boris Avraamovich; BIKYUKOV, B.V., red.; TURASHOVA, N.Ya., tekhn. red.

[Introduction to the theory of finite automata] Vvedenie v teroiiu konechnykh avtomatov. Moskva, Gos.izd-vo fiziko-matem. lit-ry, 1962. 404 p. (MIRA 15:5)
(Automatic control) (Electronic calculating machines)
(Electronic digital computers)

33243
S/199/62/003/001/003/003
B112/B108

16.7000

AUTHOR: Trakhtenbrot, B. A.

TITLE: Finite automata and logic of one-digit predicates

PERIODICAL: Sibirskiy matematicheskiy zhurnal, v. 3, no. 1, 1962, 103-131

TEXT: The author considers an arithmetical theory I which consists of subject variables, predicate variables, functions of immediate consequence, atomic formulas, and operators of logical decision. A formula $\mathcal{A}(X_1,\ldots,X_n,t)$ is said to be t-controllable from above if each of its quantors is bounded from above (t-controllable from below if each of its subject quantors is bounded from below). A formula which is t-controllable from below is said to be an upper t-formula if each of its subject quantors is bounded from below by a free variable t. The algorithm of I consists of two processes: elimination of subject quantors and elimination of predicate quantors. An important result is the following: There is an algorithm which transforms each formula $\mathcal{A}(X_1,\ldots,X_n)$ into an equivalent formula of the form $\Omega[\Gamma_1,\Gamma_2,\ldots,\tilde{\Gamma}_1,\tilde{\Gamma}_2,\ldots]$, where Ω is a logical algebraic function

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B112/B108

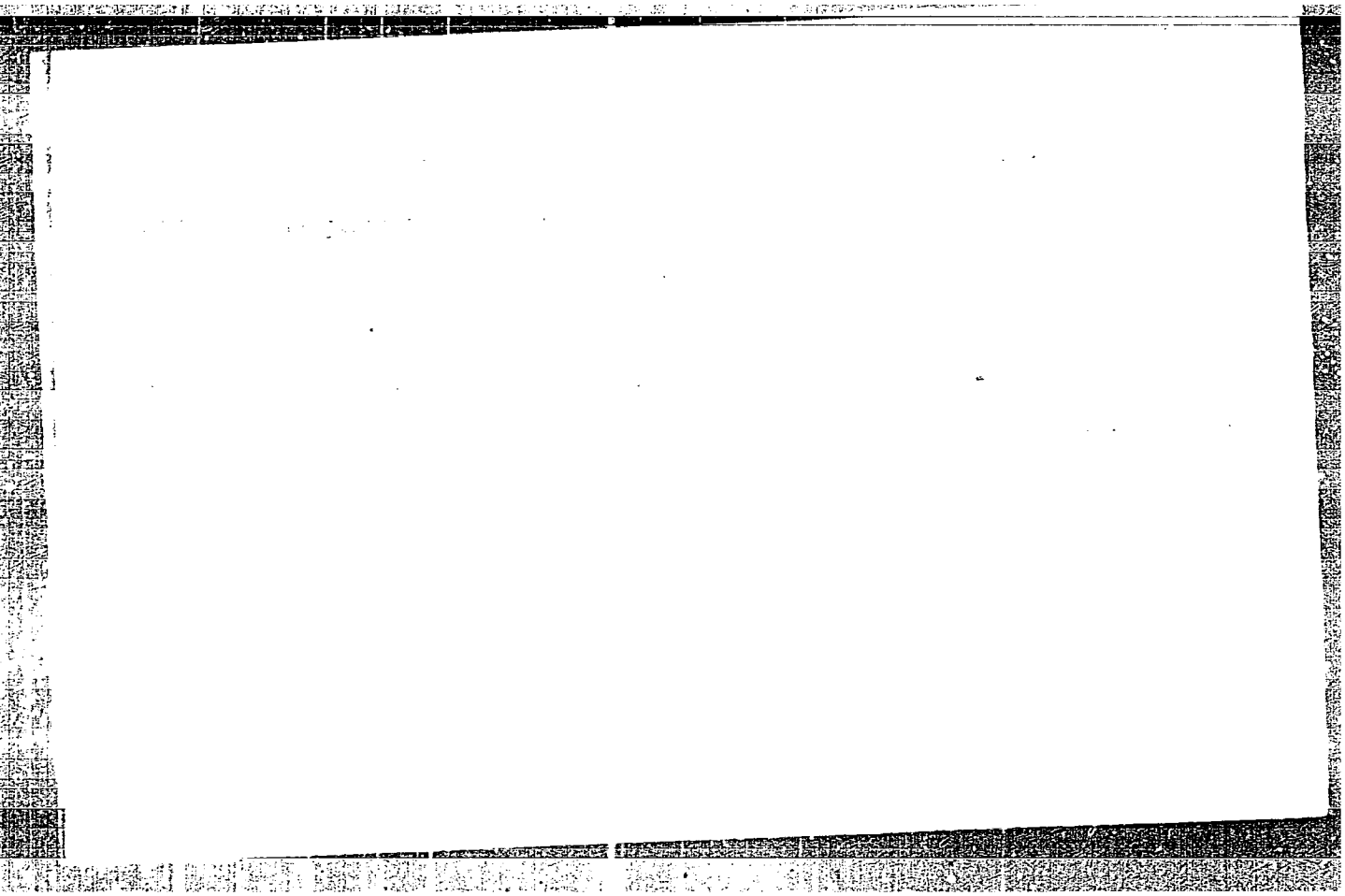
Finite automata and logic of ...

and where Γ_i and $\tilde{\Gamma}_i$ are lower and upper t-formulas. The properties of the sets (numbers and predicates) and of the operators which are definable in I are investigated. Specially, A-operators (which can be realized in finite automata and algorithms which produce A-operators are studied (problem of decidability and problem of synthesis). V. I. Shestakov is mentioned. There are 12 references: 8 Soviet and 4 non-Soviet. The four references to English-language publications read as follows: Church A., Application of recursive arithmetic in the theory of computers and automata, Univers. Michigan, 1959; Büchi J. R., Weak second order Arithmetic and finite Automata, Zeits. für mathem. Logik und Grundlagen der Mathematik, 6 (1960); Robinson R. M., Restricted set-theoretical definitions in Arithmetic, Proc. Amer. Math. Soc., 9, N 5 (1958), 238 - 242; Putnam H., Decidability and essential undecidability, J. Symb. Logic, 22, N 1 (1957), 39-54.

SUBMITTED: May 15, 1961

X

Card 2/2



APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R001756420020-4"

base 2 logarithm of the argument. [illegible]
the forementioned three-parameter expedient (3-dimensional space). The proof is [illegible]

operator element may be referenced. [illegible]

SUBMITTED: [illegible]

SUB CODE: DP [illegible]

2/2

TRAKHTENBROT, B.A.

Turing computation with logarithmic retardation. [illegible]
no.4:33-48 '64.

TRAKHTENBROT, B.A. (Novosibirsk)

Complexity of circuits realizing multiparametric families of operators. Probl. kib. no.12:99-112 '64. (MIRA 18:6)

TRAKHTENBROT, B.A.

Frequency computation of functions. Alg. i log. 2 no. [illegible] (MIRA 12:4)
'63.

TRAKHTENBROT, B. A.

Dissertation defended for the degree of Doctor of Physicomathematical Sciences at the Joint Scientific Council on Physicomathematical and Technical Sciences; Siberian Branch

"Investigations on the Synthesis of Terminal Automatic Machines."

Vestnik Akad. Nauk, No. 4, 1963, pp 119-145

TRAKHTENBROT, B.A.

Finite automats and the logic of one-digit predicates. Sib. mat. zhur. 3 no.1:103-131 Ja-F '62. (MIRA 15:3)
(Automation) (Calculus of predicates)

TRAKHTENGERTS, Anatoliy Yakovlevich; MOSKOVSKIY, F.A., red.; SAVEL'YEV, V.I., red.; LARIONOV, G.Ye., tekhn.red.

[Accounting for capital investments and capital construction] Bukhgalterskii uchet kapital'nykh vlozhenii i kapital'nogo stroitel'stva. Pod red. F.A.Moskovskogo. Moskva, Gosenergoizdat, 1962. 565 p. (MIRA 15:11)

(Capital investments—Accounting)
(Construction industry—Accounting)

TRAKHTENGERTS, Anatoliy Yakovlevich

Promyshlennyy uchet na elektrostantsiyakh, zavodakh i torfopredpriya-tiyakh "Industrial Accounting in Power Plants, Factories, and Peat Processing Plants," by A. Ya. Trakhtengerts i V. P. Kobayenkov. Moskva, Gosenergoizdat, 1958.

309 p. diagrs., tables.

"Literatura": p. 311

TRAKHTENGERTS, Anatoliy Yakovlevich; KOBAYENKOV, Vladimir Fedorovich; MOSKOVSKIY, F.A., redaktor; SAVEL'YEV, V.I., redaktor; LARIONOV, G.Ye., tekhnicheskiy redaktor

[Accounting for the material and equipment supply in major construction] Uchet predmetov material'no-tekhnicheskogo snabzheniia v kapital'nom stroitel'stve. Pod obshchei red. F.A.Moskovskogo. Moskva, Gos. energ. izd-vo, 1956. 135 p. (MLRA 9:9)
(Construction industry--Accounting)

L 2698-66

ACCESSION NR: AT5023167 UR/0000/65/000/000/0101/0112

AUTHOR: Trakhtengerts, E. A. (Moscow); Yurchenko, V. Ye. (Moscow)

TITLE: A system of commands for control computers

SOURCE: Vsesoyuznaya konferentsiya po avtomaticheskomu operativnomu upravleniyu proizvodstvennymi predpriyatiyami. 1st, Moscow, 1963. Avtomaticheskoye operativnoye upravleniye proizvodstvennymi protsessami (Automatic operative control of production processes): trudy konferentsii. Moscow, Izd-vo Nauka, 1965, 101-112

TOPIC TAGS: algorithm, computer control system, computer programming, computer theory

ABSTRACT: In formalizing the control and continuous industrial regulation algorithms by means of the table-address method and by generalized programming languages various researchers established the fact that the given algorithm consists of a series of periodically repeating standard operators. It became obvious that these operators should be realized within the system of commands of control computers. The present authors, consequently, present an appropriate system of commands and explain the writing down of such a system. They divide the control and the regulation algorithm into separate operations in such a way that the algorithm is divided into a minimum number of operators with

Card 1/2

L 2693-66
ACCESSION NR: AT5023167

a maximal repetition rate. Orig. art. has: 3 figures and 2 tables.

ASSOCIATION: None

SUBMITTED: 11May65 ENCL: 00 SUB CODE: DP, MA

NO REF SOV: 005 OTHER: 001

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L 10377-67 EWP(k)/EWT(d)/EWP(h)/EWP(l)/EWP(v)
ACC NR: AP7003063 SOURCE CODE: UR/0103/66/000/008/0139/0148

AUTHOR: Itskovich, E. L. (Moscow); Trakhtengerts, E. A. (Moscow) 27

ORG: none

TITLE: Minimization of memory size for a program of centralized production control. Part 1

SOURCE: Avtomatika i telemekhanika, no. 8, 1966, 139-148

TOPIC TAGS: algorithm, computer memory

ABSTRACT: The problem of compiling standard subroutines for realizing a centralized production control algorithm and determination of the volume of information to be processed by these subroutines is stated. A method is analyzed for determining the number of elementary operations required to run a standard subroutine. Orig. art. has: 13 formulas and 1 table. [JPRS: 38,836]

SUB CODE: 09 / SUBM DATE: 26Nov65 / ORIG REF: 004

UDC: 681.142.352.4

Card 1/1 JB

TRAKHTENGERTS, E.A.; BRUK, B.N.; LOVETSKIY, S.Ye.

Experience with machine translation of special technical texts with partial grammatical agreement. NTI no.11:25-30 '63. (MIRA 17:2)

TRAKHTENGERTS, E.A. (Moskva)

Programming languages. Avtom. i telem. 26 no.6:1115-1130 Je '65. (MIRA 18:7)

TRAKHTENGERTS, E.A.

Sorting of data on electronic digital computers; based on material from a symposium conducted by the American Association for Computing Machinery. NTI no.1:29-37 '64. (MIRA 17:3)

SHVARTS, A.M.; TRAKHTENGERTS, E.A.; BRUK, B.N.; PURTO, V.A.; FISHKINA, V.L.

Experience in literal translation of patent literature from the English language by the "Strela-3" computer. NTI no.2:42-45 '63. (MIRA 16:11)

TRAKHTENGERTS, E.A.

System of machine translation of special technical texts and retrieval of translated documents. NTI no.3:36-39 '63. (MIRA 16:11)

TRAKHTENGERTS, L., yurist

Your application. Izobr.i rats. no.5 (201):42-43 '63. (MIRA 16:7)
(Technological innovations)

TRAKHTENGERTS, M.B., inzhener; CHURINOV, P.I.

Work experience of road repair points on main highways with intensive traffic. Avt.dor.19 no.3:5-7 Mr '56. (MIRA 9:7)
(Roads--Maintenance and repair)

TRAKHTENGERTS, M.S.

Calculation of heat transfer through a multilayer wall with heat release. Inzh.-fiz. zhur. 7 no.2:48-50 F '64. (MIRA 17:2)

ACCESSION NR: AP4012792 S/0170/64/000/002/0048/0050

AUTHOR: Trakhtengerts, M. S.

TITLE: Calculation of the heat transfer through a multilayer wall with internal generation of heat

SOURCE: Inzhenerno-fizicheskiy zhurnal, no. 2, 1964, 48-50

TOPIC TAGS: heat transfer, multilayer wall, internal heat generation

ABSTRACT: The author discusses the case of an n-layers wall, each layer having a temperature-independent thermal conductivity constant λ_i, and each layer generating an amount of heat q_{vi}. The temperature varies across the width of the wall only, and the boundary conditions may be of the first, second, or third kind. The goal consists in finding the temperature distribution within the wall and the associated heat flows. Using the boundary conditions of the third kind, the solution of the system of equations

$$\frac{d^2t_i}{dx^2} + \frac{q_{vi}}{\lambda_i} = 0 \quad (i = 1,2, \ldots, n) \qquad (1)$$

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is in the plane case in the form

$$q_{x1} = \left(T_{*1} - T_{*2} - \frac{1}{2} \sum_{i=1}^{n} q_{vi} \frac{\delta_i^2}{\lambda_i} - \sum_{k=2}^{n} \frac{\delta_k}{\lambda_k} \sum_{i=1}^{k-1} q_{vi}\, \delta_i - \frac{1}{\alpha_2} \sum_{i=1}^{n} q_{vi}\, \delta_i \right) x$$

$$x \left(\frac{1}{\alpha_1} + \sum_{i=1}^{n} \frac{\delta_i}{\lambda_i} + \frac{1}{\alpha_2} \right)^{-1} . \qquad (5)$$

where T_{*1} and T_{*2} are the temperatures of the two liquids and the δ_i's are the thicknesses of the layers. [Abstracter's note: α_1 and α_2 were not defined.] The maximum temperature is given by the expression

$$T_{max} = T_{cr1} + \frac{q_{x1}^2}{2\lambda q_{v1}} . \qquad (6)$$

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R001756420020-4"

ACCESSION NR: AP4012792

(T_{ar1} is the temperature at x = 0, etc.). Similar equations hold for the cylindrical case. The above equations may be generalized for the case of variable $\lambda(T)$ and $q_{v1}(x)$ utilizing the function $\Phi(T, 0) = \int_0^T \lambda\, dT$. Such equations can be used during the design of setups exhibiting internal generation of heat. Orig. art. has 11 equations.

ASSOCIATION: None

SUBMITTED: 30Sep63 DATE ACQ: 26Feb64 ENCL: 00

SUB CODE: PH, NS NO REF SOV: 003 OTHER: 000

Card 3/3

DEGTIAREV, S. N. and TRAKHTENGERTS, M. B.

Snegovye voenno-avtomobil'nye dorogi. [Military automobile snow-roads]. Moskva, Voenizdat, 1942.

SO: Soviet Transportation and Communication, A Bibliography, Library of Congress, Reference Department, Washington, 1952, Unclassified.

S/203/61/001/005/008/028
A006/A101

9,9869

AUTHORS: Gershman, B.N., Trakhtengerts, V.Yu.

TITLE: On the effect of ions on the nature of propagation of whistler atmospherics

PERIODICAL: Geomagnetizm i aeronomiya, v. 1, no. 5, 1961, 671 - 678

TEXT: Previous studies on the connection between the ion component in the upper atmosphere and peculiarities in the propagation of whistler atmospherics, did not yield final results. The authors analyzed the effect of ion motion on the nature of the trajectory of whistler atmospherics. The direction of group velocity was analyzed on the basis of the variance equation which characterizes the propagation of normal waves in a magnetoactive plasma. The motion of both electrons and ions was taken into account. The results obtained are used to analyze the trajectory of whistler atmospherics. Particular attention is paid to the regularities of passage of the low-frequency component through the upper atmosphere of the Earth. This component was recorded during the reception of atmospherics. The latter phenomenon is connected with the fact, that the presence of protons in the upper atmosphere may be essential for the propagation of radio-

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S/203/61/001/005/008/028
A006/A101

On the effect of ions ...

waves in the range of lowest frequencies. There are 3 figures and 13 references: 4 Soviet-bloc and 9 non-Soviet-bloc.

ASSOCIATION: Gor'kovskiy gosudarstvennyy universitet imeni N.I. Lobachevskogo (Gor'kiy State University imeni N.I. Lobachevskiy) Nauchno-issledovatel'skiy radiofizicheskiy institut (Scientific Research Institute of Radiophysics)

SUBMITTED: July 20, 1961

Card 2/2

3,2430
3,1820

S/203/62/002/004/005/018
I046/I242

AUTHORS: Gershman, B.N. and Trakhtengerts, V.Yu.

TITLE: Dispersion of whistlers as a criterion of concentrations in solar corpuscular streams

PERIODICAL: Geomagnetizm i aeronomiya, v.2, no.4, 1962, 653-658

TEXT: Dispersion of whistlers (whistling atmospherics) in atmospheric regions disturbed by solar corpuscular streams at given latitudes is calculated from

$D(45^\circ)=0.6\sqrt{N_n}$; $D(50^\circ)=0.96\sqrt{N_n}$; $D(60^\circ)=4.1\sqrt{N_n}$; $D(65^\circ)=8.6\sqrt{N_n}$;

where N_n is the unknown electron concentration in the corpuscular streams at the earth's orbit. The D-values calculated for $N\sim10^4$ - 10^5 cm^{-3} are considerably higher than the experimental dispersion maxima for $\varphi > 50^\circ$. Thus, the electron concentration at the earth's orbit should not exceed several thousand particles per cm^3. All calculations are made without considering the plasma drift, a

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S/203/62/002/004/005/018
I046/I242

Dispersion of whistlers...

legitimate approximation for velocities $V \leq 10^9$ cm/sec (the characteristic velocities of the corpuscular streams are $5 \cdot 10^7$ - 10^8 cm/sec).

ASSOCIATION: Radiofizicheskiy institut pri Gor'kovskom gosudarstvennom universitete (Radiophysical Institute at the Gor'kiy State University)

SUBMITTED: March 26, 1962

Card 2/2

KOVNER, M.S.; TRAKHTENGERTS, V.Yu.

Interaction of weak corpuscular streams in the upper atmosphere. Geomag.i aer. 2 no.6:1053-1060 N-D '62. (MIRA 16:1)

1. Radiofizicheskiy institut pri Gor'kovskom gosudarstvennom universitete.

(Atmosphere, Upper)

ANDRONOV, A.A.; TRAKHTENGERTS, V. Ya.

Instability of one-dimensional packets and the absorption of electromagnetic waves in a plasma. Zhur. eksp. i teor. fiz. 45 no.4:1009-1015 O '63. (MIRA 16:11)

1. Radio-fizicheskiy institut Gor'kovskogo gosudarstvennogo universiteta.

ACCESSION NR: AP4031626 S/0203/64/004/002/0233/0242

AUTHORS: Andronov, A. A.; Trakhtengerts, V. Yu.

TITLE: The kinetic instability of the outer radiation belt of the earth

SOURCE: Geomagnetizm i aeronomiya, v. 4, no. 2, 1964, 233-242

TOPIC TAGS: radiation belt, aurora, corpuscular stream, ultralow frequency, quasiequilibrium state

ABSTRACT: The authors have used quasilinear equations to construct a nonlinear theory of instability of the earth's outer radiation belt. They have determined the values and time dependence of particle streams (electrons) leaving the belt, and they have computed the intensity of ultralow-frequency noise. Although complete loss of particles from the belt because of the indicated instability is very small (about 1-10% of the total number of particles), the differential loss at any definite energy level may be considerable. Loss of particles from zones corresponding to electron energies of 10-25 kev may amount to as much as 35% of the total number of electrons in this energy interval. In the quasiequilibrium state, the belt must therefore be a "pile-up" in the energy spectrum of electrons in the

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energy zone of 11-25 kev. A "plateau" in the intermediate zone of the belt leads to a decrease in the initial anisotropy. In this zone the concentration of electrons at the maximum for the belt may change because of spatial redistribution of entrapped particles. Ultralow-frequency noise and particle streams in the atmosphere may be localized by longitude, since the drift time of electrons with energies in the vicinity of 20 kev is on the order of 24 hours, much greater than the damping time of the ultralow-frequencies. The presence of external sources of ultralow-frequency radiation (such as artificial sources) may change the redistribution time and the stream of particles leaving the belt. The authors consider their computations preliminary. They point out that a detailed explanation of the instability factor in the belt in producing the observed effects awaits an accumulation of experimental data on the electron spectrum in the belt and on simultaneous observations on the intensities of entrapped particles, ultralow-frequency noise, and polar auroras. The indicated mechanism probably applies chiefly to the middle latitudes. Other mechanisms may be at work in the zone of polar auroras, where the effect of solar corpuscular streams is direct. "The authors express their thanks to D. N. Gershman for his interest in the work and for his remarks." Orig. art. has: 1 figure and 31 formulas.

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ACCESSION NR: AP4031626

ASSOCIATION: Radiofizicheskiy institut pri Gor'kovskom gosudarstvennom universitete (Institute of Radiophysics, Gorkiy State University)

SUBMITTED: 16Nov63 DATE ACQ: 30Apr64 ENCL: 00

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Card 3/3

L 10242-67 EWT(1)/FCC GW

ACC NR: AP6028552 SOURCE CODE: UR/0053/66/089/002/0201/0225

AUTHOR: Gershman, B. N.; Trakhtengerts, V. Yu.

ORG: Scientific Research Radiophysics Institute of the Gor'kiy State University (Nauchno-issledovatel'skiy radiofizicheskiy institut Gor'kovskogo gosudarstvennogo universiteta)

TITLE: Very low frequency radio emission from the upper atmosphere and its connection with other geophysical phenomena

SOURCE: Uspekhi fizicheskikh nauk, v. 89, no. 2, 1966, 201-225

TOPIC TAGS: vlf, vlf propagation, upper atmosphere, exosphere, artificial earth satellite

ABSTRACT: This is a review, with emphasis on the results obtained since 1960, of the information concerning the state of the exosphere which can be extracted from radio signals of variable frequency between 1 and 20 kcs (whistlers), especially the radio waves generated in the exosphere directly. The most essential results of recent years, obtained by reduction and analysis of whistler observations, are first reviewed. The different types of vlf radiation (hiss, chorus, and discrete radiation) are described and the results of systematic observations obtained with land based equipment and satellites are presented. This is followed by problems involved in the generation of different types of whistlers and an analysis of the significance of vlf noise in the dynamics of the earth's outer radiation belt, and the role of vlf radiation in the

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ACC NR: AP6028552

dynamics of the earth's radiation belts. It is concluded that the recent experimental results can throw light on the origin of different types of vlf radiation, and that there are important grounds for assuming that this radiation is produced by high-energy particles in the earth's outer radiation belt and in the aurora zones. There are also reasons for assuming that the vlf radiation plays an important role in the dynamics of the earth's radiation belts. Several problems whose solutions will contribute to clarification of the nature of vlf radiation are listed. Orig. art. has: 6 figures and 35 formulas.

SUB CODE: ~~ES~~ 04/ SUBM DATE: 00/ ORIG REF: 041/ OTH REF: 090

Card 2/2

ACC NR: AP6032686 SOURCE CODE: UR/0203/66/006/005/0827/0836

AUTHOR: Trakhtengerts, V. Yu.

ORG: Institute of Radiophysics, Gor'kiy State University (Radiofizicheskiy institut pri Gor'kovskom gosudarstvennom universitete)

TITLE: Stationary states of the outer radiation belt around the earth

SOURCE: Geomagnetizm i aeronomiya, v. 6, no. 5, 1966, 827-836

TOPIC TAGS: distribution function, radiation belt, kinetic instability, high energy electron

ABSTRACT: Formation of stationary states of the outer radiation belt around the earth is discussed under conditions of simultaneous action of the source of high-energy electrons and kinetic instability. These lead to the excitation of ultra-low frequency waves, upon which the particles diffuse into an escape funnel. The direct injection of energetic particles as well as a variety of accelaration mechanisms may serve as the source of kinetic instability. Heterogeneity of the belt is considered. The stationary spectrum of VLF noise and the distribution function for the electrons of the radiation zone are found. In general, it was established that under the investigated conditions stationary distribution of electrons f_0, having the following properties, takes place: f_0 is almost independent of the source of power I_0. Stationary density of the current of electrons in the maximum of the zone is $S_{Lmax} \sim 4 \times 10^8$ to 5×10^9

UDC: 550.385.41

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$cm^{-2}sec^{-1}$; the intensity of the VLF noise Iω and current of electrons S_A, being lost by the belt, are proportional to the power of the source. The obtained results are compared with experimental data. The author expresses his gratitude to A. A. Andronov and B. N. Gershman for helpful discussions and observations. Orig. art. has: 32 formulas and 2 figures.

SUB CODE: 04, 18/ SUBM DATE: 31May65/ ORIG REF: 015/ OTH REF: 011

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GRIGOR'YEV, G.I.; KOVNER, M.S.; NIKIFOROVA, O.G.; OBOLENSKIY, L.M., SAMSONOV, A.V.; TRAKHTENGERTS, V.Yu.

Logarithmically periodic helical irradiator for a paraboloid with a frequency overlap of 1:7. Izv. vys. ucheb. zav.; radiofiz. 8 no.4:768-770 '65. (MIRA 18:9)

1. Gor'kovskiy gosudarstvennyy universitet.

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